

LAPAROSCOPIC OVARIAN DRILLING FOR POLYCYSTIC OVARIAN SYNDROME

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REZUMAT

Objective: Scopul acestui studiu este de a evalua eficacitatea drillingului ovarian laparoscopic la paciente diagnosticate cu boala ovarelor polichistice (BOPC) rezistente la terapia cu clomifen-citrat. **Material și metode:** În acest studiu au fost introduse 30 de paciente diagnosticate cu BOPC rezistente la clomifen-citrat. Au fost utilizați ca parametri biologici și clinici, valorile testosteronului seric (T), hormonului foliculo-stimulant (FSH), hormonului luteinizant (LH), glicemiei a jeun și indicelui de masă corporală înregistrate înainte și după intervenție. **Rezultate:** Drillingul ovarian laparoscopic a fost efectuat, fără nici o complicație postoperatorie, durata medie de urmărire postoperatorie a pacientelor fiind de 28 luni. În perioada de urmarire 80% dintre paciente (n=24) au avut cicluri menstruale regulate, iar rata sarcinilor obținute spontan a fost de 36,6%. Valorile serice ale T, T liber, FSH, LH, raportului LH:FSH au fost reduse semnificativ, iar valorile glicemiei a jeun au rămas neschimbate după intervenție. **Concluzii:** Drillingul ovarian laparoscopic în terapia BOPC rezistente la clomifen poate reduce sau chiar evita apariția sindromului de hiperstimulare ovariană și a sarcinilor multiple determinate de tratamentul cu gonadotropine, fiind urmat de aceeași rată de concepție. Rata ridicată a sarcinilor obținute, mai mică decât datele din literatură, precum și aspectul economic pot face din drillingul ovarian laparoscopic o variantă atractivă de tratament al BOPC.

Cuvinte cheie: boala ovarelor polichistice, drillingul ovarian laparoscopic, infertilitate

ABSTRACT

Objective: The gonadotrophins therapy in polycystic ovary syndrome (PCOS) frequently results in polyfollicular response which can lead to ovarian hyperstimulation syndrome (OHSS) or multiple pregnancy. The aim of the present study is to evaluate the efficiency of laparoscopic ovarian drilling (LOD) in clomiphene-resistant patients with PCOS. **Material and methods:** Thirty clomiphene-resistant patients with PCOS have been included in the study. Serum testosterone (T), follicle stimulating hormone (FSH), luteinizing hormone (LH), fasting glucose levels and body mass indexes (BMIs) have been used as clinical and biological markers, before and after the procedures. **Results:** Laparoscopic ovarian drilling was successfully employed without any surgical complications on an average follow-up time of 28 months. During the follow-up 24 patients (80%) were recorded to have regular cycles and the spontaneous pregnancy rate was 36.6%; serum values for T, free T, FSH, LH, FSH/LH ratio have decreased significantly and glucose levels remained unchanged after the procedure. **Conclusions:** The LOD in clomiphene-resistant patients with PCOS may avoid or reduce the risk of OHSS and the multiple pregnancy rate induced by gonadotrophin therapy with the same rate of conception. The high pregnancy rate, even though inferior to similar studies, and the cost effectiveness of the procedure offer an attractive management for patients with PCOS.

Key Words: polycystic ovary syndrome, laparoscopy, infertility, ovarian drilling

INTRODUCTION

Recent studies show that polycystic ovary syndrome (PCOS) is present in 20-25% of the women of reproductive age. The frequency is of 30% in infertile women, 70-80% in women with anovulation and over 80% in women with hyperandrogenemia.

Although the etiology of the disease of polycystic ovary syndrome is a controversial one, the issues related to chronic anovulation, the induction of ovulation and hyperandrogenemia are widely acknowledged. The treatment landmarks are shown in weight loss, oral antidiabetics, clomiphene-citrate, treatment with gonadotropins and ovarian drilling.

Wedge resection of the ovary was the first method described in PCOS treatment, yet it was abandoned due to the risk of postdrilling adhesions. This type of intervention has been replaced by induction of ovulation with clomiphene and gonadotropins. Despite its effectiveness, the outcome of the treatment with gonadotropins has its complications, running the risk of ovarian hyperstimulation syndrome and multiple pregnancies.¹ The method is also very expensive, time consuming and requires careful monitoring.

The surgical treatment of PCOS consisting in laparoscopic ovarian drilling may avoid, reduce

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Received for publication: Apr. 11, 2012. Revised: Jun. 14, 2012.

or facilitate the action of gonadotropins and the induction of ovulation.

The purpose of this paper is to determine the efficiency of endocrinal and clinical parameters of laparoscopic ovarian drilling in clomiphene citrate resistant-patients with PCOS.

MATERIAL AND METHODS

The study includes patients of our Clinic that have been diagnosed with primary infertility with ovulatory dysfunctions, having antecedents of medical treatments (between 3 and 6 months, they were administered clomiphene 3cp./day for 5 days starting from day 5 of their menstrual cycle) and that agreed to the procedure of ovarian drilling as method of treatment. Treatment monitoring has been conducted through endovaginal ultrasound. In all cases, 1 to 4 follicles of 16-20 mm have been found.

Ovulation was triggered by the administration of a dose of chorionic gonadotropin (Pregnyl) of 10000 UI in all patients. Sexual contact was recommended in 36 hours from the intramuscular administration of chorionic gonadotropin.

The PCOS diagnosis was established based on the Rotterdam consensus criteria (2 out of 3 present): oligo/anovulation, clinical/biological signs of hyperandrogenism, polycystic ovaries (presence of 12 follicles or more of 2-9 mm in each ovary and/or the increase of ovary volume >10 mL).

The normal values considered of the biochemical parameters tests were the following: glucose 76-110 mg/dl; FSH - 3.5-12.5 mUI/ml; LH - 2.4-12,6 mUI/ml; total testosterone - 0.06-0.82 ng/ml; free testosterone - 0.1-4.1 pg/ml.

The surgical technique used was the introduction of 3 trocars: a subumbilical one and the other 2 in the iliac fossa, bilaterally. Through the trocars of the iliac fossa, a grasping forceps was introduced to lift the ovary by means of the utero-ovarian ligament and a diathermy needle used in ovarian drilling. The diathermy needle was 7-8 mm long and reached 0.5 mm in diameter, the coagulation current being set to 30W and the duration of each penetration of the ovarian tissue was of \approx 1 s. A number of 10 to 15 punctures were made in each ovary, each having a length of 3 mm and a depth between 4 and 6 mm, according to the dimension of each ovary. After the diathermy puncture, a solution of 0.9% NaCl was used to wash the peritoneal cavity.^{2,3}

In the follow-up of the ovarian drilling, patients were instructed to keep a record of their menstrual cycle. Thus, where menstruation was recorded after

6 weeks from the intervention, we administrated, in the 3rd day of the menstrual cycle, the dosage of the serum concentration of total testosterone, free testosterone, LH, FSH and glucose, and in the value of progesterone on the 21st day of the cycle. Ovulation was diagnosed at a progesterone value higher than 8ng/ml. The characteristics of menstrual cycles, the number of pregnancies obtained and their evolution were considered.

RESULTS

The study employed 30 patients of a 28-year old average who were followed approximately 28 months after the intervention. In the follow-up period, 80% of them had regular menstrual cycles and the pregnancy rate obtained spontaneously reached 36.6%. After the laparoscopic ovarian drilling, the average period for the first pregnancy was 3.6 months. The weight and body mass index did not change significantly after the procedure.

The clinical and hormonal profiles of patients have been recorded before and after the procedure. (Table 1) Significant differences were found as far as the serum values of FSH, LH, the LH/ FSH ratio and testosterone were concerned. Moreover, menstrual abnormalities – the most frequent symptom – were ameliorated in approximately 80% of the patients.

DISCUSSION

The efficiency of surgical treatment consisting of partial ovary removal in PCOS was first communicated in 1935.⁴ Partial ovary removal was the preferred intervention in PCOS until a connection between this type of intervention and the occurrence of the pelvic adhesive disease which may lead to mechanical infertility was found.⁵⁻¹⁰

The rate of occurrence of the postdrilling ovarian adhesion syndrome varies significantly in literature, from 0% 8 to 100%.^{7,9} However, it seems that the conception rate is not affected by the occurrence of postdrilling adhesions; yet, each patient that will be subjected to this intervention has to be informed about the risk of postsurgical adhesion syndrome.

Gugan et al. reported a 68% occurrence rate for adhesions in 19 patients with laser photocoagulation of ovaries and who, in a second-look laparoscopy after 4 weeks from the intervention, had lax adhesions which could be easily lysated.¹⁰ However, as compared to another sample of patients which did not have a second-look intervention, the pregnancy rate was the same.

Table 1. Hormonal profiles, regularity of menses and percent of spontaneously obtained pregnancies in patients with PCOS before and after the laparoscopic ovarian drilling.

	Before drilling	After drilling	Significance (95%CI)	Significance
FSH* (mIU/ml)	3.95 ± 0.217671	4.64 ± 0.207722	p = 0.000 (p << 0.01)	ss
LH* (mIU/ml)	5.62 ± 0.330829	4.47 ± 0.315055	p = 0.000640	ss
LH/FSH*	1.58 ± 0.283052	1.02 ± 0.157933	p = 0.000108	ss
Testosterone* (ng/ml)	0.73 ± 0.165980	0.66 ± 0.114807	p = 0.002125	ss
Free testosterone* (pg/ml)	2.09 ± 0.133161	1.9 ± 0.136626	p = 0.001197	ss
Glucose* (mg/dl)	82.3 ± 4.497837	83.9 ± 4.614119	p = 0.928676	ns
Regular cycles (%)	16	80		
% spontaneously obtained pregnancy rate	-	36		

*The mean value ± std. deviation of parameters were represented before and after laparoscopic ovarian drilling.

Thirty years ago, Cohen et al. reported the first pregnancy after laparoscopic ovarian drilling. From that moment, the laparoscopic approach became a current procedure in clomiphene-resistant patients with PCOS as the intervention could be carried out with the help of unipolar current, laser, ultrasonic bistouries or water jet.¹¹

However, the guides of the American College of Obstetricians and Gynaecologists do not define clearly the role of the surgical treatment.¹² But on the other hand, in clinical studies, the ovulation rate after laparoscopic ovarian drilling varies between 70-90%, and the conception rate between 60-70%, without treatment with ovulation inducers.¹³

The main indication of ovarian drilling is resistance to clomiphene treatment in infertile couples. Laparoscopic ovarian drilling is recommended for patients with a permanently increased secretion of LH, either per natural cycle or as response to clomiphene treatment. It can also be used in patients that require laparoscopy for other medical conditions, as well as in patients living far away from the medical centres where ovarian stimulation monitoring can be made. Due to the risks of a surgical intervention, drilling as treatment of menstrual cycle dysfunctions or hyperandrogenism is not recommended.^{14,15}

In our study, the ovulation rate was 80%, and the pregnancy rate 36.6%. Despite the success of the drilling, its long-term efficiency needs to be considered. The only report on the long-term effects of drilling was made by Amer et al. who recorded an amelioration of menstrual cycles for a period from 4 to 9 years in third of the patients.¹⁶⁻¹⁹

Laparoscopic ovarian drilling can also be carried out by means of monopolar electrode or laser. There are no differences between the two methods of ovarian drilling.²⁰ There are many variables which

can influence ovarian drilling such as anthropometric features and ovarian morphology. Most authors acknowledge the efficiency of a number of 4 to 10 points of diatermocoagulation.²¹ The surgeon's experience is extremely important.

Farquhar et al. compared laparoscopic ovarian drilling with gonadotropin therapy in infertile women diagnosed with PCOS.¹⁹ Except for the lower rate of multiple pregnancies, no significant differences between the two methods of treatment were found, and the study could not reach a precise conclusion on the role of laparoscopic ovarian drill in PCOS.

In our opinion, from a pharmaco-economic viewpoint, laparoscopic ovarian drilling could be used as first intention treatment in PCOS patients resistant to clomiphene as it is cheaper than gonadotropin treatment.

CONCLUSIONS

In conclusion, we could assert that laparoscopic ovarian drilling is an efficient treatment method for infertile anovulatory patients. The results obtained are as favourable as the biochemical profile of patients before surgery is less deteriorated. The costs incurred by the procedure can also recommend it as second-line therapy in all cases that do not respond in 6-month time to clomiphene citrate therapy, being able to replace gonadotropin therapy successfully.

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